NINE MILE HYDROELECTRIC DEVELOPMENT
On State Highway 291 along Spokane River
Nine Mile Falls vicinity
Spokane County
Washington

HAER No. WA-84

PHOTOGRAHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
Western Regional Office
National Park Service

HISTORIC AMERICAN ENGINEERING RECORD

Nine Mile Hydroelectric Development

HAER No. WA-84

Location: On State Highway 291, near River Mile 58 on the Spokane River
Nine Mile vicinity, Spokane County, Washington

UTM: A 11.459130.5291440; B 11.459380.5291210; C 11.459120.5291200
Quad: Nine Mile Falls, Washington (U.S.G.S. 7.5 minute)

Date of Construction: 1906-1908

Architect/Engineer: Sanderson & Porter, New York, New York

Present Owner: The Washington Water Power Company

Present Use: Generation and transmission of hydroelectric power

Significance: Completed in 1908, the Nine Mile hydroelectric facility was constructed by mining entrepreneur and capitalist Jay P. Graves for the purpose of developing and providing power to his electric railroad system, the Spokane and Inland Empire Railroad Company. Following a decline in the popularity of electric railway transportation systems in the 1920s, the Washington Water Power Company (WWP) acquired the Nine Mile facility in 1925. The facility is significant for the role it played in the development of the electric railway industry in eastern Washington, in the growth of agriculture and agricultural communities served by the railroad, and in the later expansion of the WWP's electrical transmission network throughout eastern Washington and northern Idaho. The ten operators' cottages (constructed in 1928-1930) that stand adjacent to (northwest of) the powerhouse and dam exemplify the residential component necessary for the operation of hydroelectric facilities in remote locations during the early twentieth century. Constructed in the Craftsman and English Cottage styles of the period, the cottages retain good exterior integrity, as does the powerhouse and dam. The powerhouse, dam, and operators' cottages are contributing elements in the Nine Mile Hydroelectric Power Plant Historic District, a property listed in the National Register of Historic Places in 1990.

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Date: April 1993

INTRODUCTION

The Washington Water Power Company's (WWP) Nine Mile hydroelectric development (HED) is situated on the Spokane River, near River Mile 58, in Spokane County, Washington. It is located approximately 16 miles downstream (northwest of) the central business district of Spokane, Washington, eastern Washington State's largest city.

Mining entrepreneur and capitalist Jay P. Graves constructed the Nine Mile HED expressly to generate power for his electric railroad, the Spokane and Inland Empire Railroad Company. Eventually that railway system included 250 miles of line that connected agricultural communities in eastern Washington and northern Idaho. Development of the railway stimulated the economy of metropolitan Spokane, enhanced development of agriculture, and facilitated town-building in smaller outlying communities served by that system.[1] Following the decline in popularity of electric railway systems that began about 1920, the WWP purchased the Nine Mile HED (a property then in receivership) in 1925.[2]

That acquisition allowed the WWP to consolidate its holdings on the Spokane River, and to expand its electrical service network in eastern Washington and northern Idaho. Before acquisition of the Nine Mile HED, the WWP had constructed five hydroelectric facilities on the Spokane River, with the Nine Mile HED the only power site not controlled by the WWP. Purchase of the Nine Mile hydroelectric facility also gave the company exclusive control of Coeur d'Alene Lake, a body of water located at the mouth of the Spokane River ca. 58 miles to the east. With a storage capacity of ca. 157,000 acre ft, the lake served as a reliable holding reservoir for the company's integrated Spokane River power sites.[3] In conjunction with the WWP's expansion activities during the decade of the 1920s, the company began construction of the present ten caretakers' cottages (an assemblage of dwellings called the "village complex") in 1928. The last cottage was completed in 1930.

The Nine Mile Hydroelectric Power Plant Historic District was listed in the National Register of Historic Places in 1990. The historic district is important as "one of the most significant extant properties associated with Interurban railroads in Washington," while the cottages reflect

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[1]Anonymous, *History of the City of Spokane and Spokane Country, Washington*, Vol. III (Spokane, Washington: The S. J. Clarke Publishing Company, 1912:422).

[2]Anonymous, "Washington Water Power Co. Acquires Nine-Mile Plant," *Journal of Electricity*, vol. 55, No. 4, p. 145.

[3]Robin Bruce, "A Cultural Resources Survey and Evaluation of The Washington Water Power Company's Nine Mile Hydroelectric Project, Spokane County, Washington," Archaeological and Historical Services Short Report Series No. SR-239, Eastern Washington University, 1991.

WWP's expansion of their diversified service network following the company's acquisition of the Nine Mile HED in 1925.[4] The well-preserved cottages are important for their architectural and artistic distinction and because they are representative of company housing constructed by WWP at other hydroelectric facilities during the late 1920s.

MITIGATION

The WWP has filed an application for Amendment of License from the Federal Energy Regulatory Commission (FERC) to increase the installed capacity at the Nine Mile Hydroelectric Development of the Spokane River Project, FERC No. 2545. WWP's proposed modifications reflect necessary repairs associated with maintenance of the facility and upgrades to increase energy production. The proposed undertaking is expected to adversely affect the following elements identified as contributing to the property's significance in the NRHP nomination:

Modifications Relating to Maintenance

1) WWP proposes to replace the existing intake gates and trash racks with new structures. This portion of the project will also involve replacement of the existing gate lifting mechanism (the "mule") with a new hydraulic lifting system.

Modifications Relating to WWP's Application to the Federal Regulatory Commission (FERC) for Amendment to License

1) WWP proposes to replace turbine-generator units 3 and 4 with new units.

2) In order to accommodate construction of a new switching yard (substation) adjacent to (northwest of) the powerhouse, WWP proposes to relocate or demolish caretaker cottages 1, 2, and 3.

This report has been prepared in compliance with a Memorandum of Agreement among the FERC, the Washington SHPO, and the Advisory Council on Historic Preservation, with the concurrence of The Washington Water Power Company, to mitigate adverse effects of WWP's undertaking on historic properties within the Nine Mile Hydroelectric Plant Historic District.

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[4]Leonard Garfield and Lisa Soderberg, "Nine Mile Hydroelectric Power Plant Historic District," nomination to the National Register of Historic Places (NRHP), 1 Ausust 1990:Section 8:1.

SITE DESCRIPTION AND LAYOUT

The Nine Mile Hydroelectric Power Plant Historic District is located in the SE 1/4 of Sec. 6, T26N, R42EWM, near metropolitan Spokane Washington. At that location, the Spokane River flows north before looping westerly toward its confluence with the Columbia River. The topography in the vicinity of the Nine Mile HED "is nearly level to gently sloping, except for steep terrace breaks along drainageways. The native vegetation was bunchgrass or open stands of ponderosa pine and an understory of bunchgrass."[5] Although urban development has encroached from the south, the adjacent landscape to the north, east, and west of the powerhouse and dam yet resembles its historic appearance (see photographs WA--84-1 and WA-84-2). The Nine Mile power site was considered remote from urban Spokane at the time of its construction (1906-1908), as it was years later in 1928 when the WWP began construction of the present caretakers' cottages. However, in the decades since completion of the cottages (1930), suburban development has extended north to the powerhouse and dam, and, though yet rugged, the site no longer conveys the sense of seclusion that once characterized that location.

The historic properties that comprise the Nine Mile Hydroelectric Power Plant Historic District are located on a triangular-shaped flat of less than 20 acres, situated on the west side of the Spokane river. The flat is bounded on the south by the Nine Mile Reservoir, on the north and west by Carlson Road, and on the east by the Spokane River. The village complex frames the entrance driveway (Old Charles Road) that leads to the powerhouse and dam from Carlson Road. The cottages face the driveway in staggered rows, with five cottages located on either side of the gently winding, tree-lined lane. Although roughly twenty-five years intervened between construction of the Nine Mile hydroelectric facility and the village complex, in appearance, those properties form an integrated and complementary grouping. The aged domestic maple trees that line the driveway and the connected mowed lawns within the village complex create a park-like setting and confer a contrasting sense of domesticity and serenity to the industrial site and the rugged terrain of which it is a part. (See Nine Mile Hydroelectric Development Sketch Plan, page 37).

DESCRIPTION OF POWERHOUSE, GENERATING EQUIPMENT, INTAKE GATES, AND SPILLWAY DAM

The powerhouse is constructed of a combination of brick, concrete, and "cyclopean masonry," while the dam is constructed of mainly cyclopean masonry (see the **Engineering Significance of the Nine Mile Hydroelectric Facility** section of this report for a description of the technique of cyclopean masonry construction).

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[5]Norman C. Donaldson and Laurence D. Giese, *Soil Survey Spokane County, Washington*, United States Department of Agriculture, March 1968:3

The powerhouse measures ca. 116 ft (north-south) by ca. 139 ft (east-west). The three-level structure stands ca. 120 ft high (see photographs WA-84-B-16 and WA-84-B-17). Each of the three levels is accessed from within by steep-pitched metal stairways. In keeping with its historic function, the powerhouse's exterior is utilitarian in appearance:

> [T]he north side of the powerhouse is punctuated by two stories of multi-pane wood sash arched windows set in segmental bays. Keystones adorn the arched hoods of the taller upper story windows, and a concrete stringcourse unites the hoods across the facade. The flat roof of the building is constructed of a steel frame and concrete, and is articulated by a projecting concrete cornice supported by brackets.[6] (See photograph WA-84-A-2).

The downstream (north), east, and west sides of the building, as well as the middle wall, are steel framed, as is the roof. The steel framed roof was filled with concrete, and made waterproof with malthoid roofing, copper flashed. Soon after its construction, an article describing the Nine Mile project assessed the exterior appearance of the powerhouse:

> There was no particular attempt at ornamentation. The building, however, is well proportioned, presents a pleasing appearance, and is a good example of a building used for industrial purposes.[7]

That same description of the "just completed" powerhouse further described design features of the powerhouse as it exists today:

> The water pressure against the upstream face of the power house is resisted by five buttress walls that extend from the water-stop wall at the upstream side of the building and from the top of the building down to the lowest downstream point, these buttress walls forming the dividing walls for the tail water. These buttresses are 12 ft. thick and the spaces between them are 15 ft. wide or the buttress walls are 27 ft. center to center. Between the buttress walls are the turbine chambers at elevation 13, the transformer rooms at elevation 34.6, and between these walls, extending from the turbine chamber floor to the tail race are the two sets of draft tubes, built in a solid mass of concrete. The upper discharge point of the draft tube is 7 ft. below low water in the tail race, so that the draft tubes are always water-trapped.

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[6]Garfield and Soderberg, 1 August 1990:Section 7:1.

[7]"Hydro-Electric Power Plant of the Inland Empire System," *Journal of Electricity*, Vol. XXXII, No. 19, 10 October 1908:902.

> At the upstream side of the building, extending the full length of the building and from elevation 53 to 87, or 34 ft., averaging about 16 ft. in thickness, is a solid concrete wall, supported by the buttress walls, which not only acts as a water-stop, but adds about 4000 tons to the building at a point where it is most effective.[8]

The gantry, or entry room, is ca. 32 ft wide, extends the full length of the power house, and forms the upper level of the powerhouse. Four large iron doors (upper bulkheads) located on the river (south) side of the gantry room provide access to the turbine chambers below. As part of WWP's present upgrades, the original 25-ton Whiting Foundry Equipment Company gantry room crane that presently serves the turbine chambers is scheduled to be replaced with a 35-ton crane. The gantry room is accessed by large service doors which open to the driveway from the building's west end (see photograph WA-84-B-1).

A solid brick wall divides the gantry room (upstream side) and the switch gear room (downstream side) of the multi-level building. The wall also forms the downstream wall of the transformer room, where cable portals once conveyed high-tension wires from transformers located within the buttress bays to high-tension switches in the switch gear room (see photograph WA-84-B-6). The switch gear room (middle level) extends the full length of the powerhouse and is situated directly over the generating room. It measures ca. 29 ft wide and is 37 ft high. The switch gear room originally contained lightning arresters, choke coils, series coils, high- and low-tension oil switches, selector switches and other switching apparatus that is today largely non-operational, having, as new technology became available, either been abandoned in-place or replaced with computerized modern Process Control Units (PCU's) presently located in the generating room.

The generating room (lowest level) extends the entire length of the powerhouse, with the floor situated 14 ft higher than the tail water. The four original turbine/generator units sit in an east/west alignment (see photographs WA-84-B-9, WA-84-B-10, and WA-84-B-16): No. 1 (east) through No. 4 (west). That equipment basically converts mechanical energy (flow of water through turbines) to electrical energy in the generator by rotating an electrical field over stationary conductors. Four bulkheads (lower bulkheads), each with a manhole in the iron bulkhead plate, provide access to the turbine chambers from the generating room and also serve as conduits for the main turbine/generator shaft (see photograph WA-84-B-12).

The turbines are Hercules water wheel manufactured by the Holyoke Machine Company, Worcester, Massachusetts. Each of the four units consists "of four 42-in. wheels mounted on a horizontal shaft and arranged in pairs, with a central discharge draft tube for each pair."[9]

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[8]"Hydro-Electric Power Plant of the Inland Empire System," 10 October 1908:901.

[9]"Hydro-Electric Power Plant of the Inland Empire System," 10 October 1908:899.

The alternating current (AC) generators were manufactured by the Westinghouse Company, Pittsburgh, Pennsylvania (see photograph WA-84-B-19). The generators are 3,000 kw, 2,200 volt, three phase, 60 cycle, 240 RPM units, patented 1894-1905 (nameplate rating). In front of each of the four generators stands a direct current (DC) exciter. The exciters were manufactured by the Westinghouse Electric and Manufacturing Company, Pittsburgh, Pennsylvania. Two original generators and their exciters are scheduled for replacement as part of WWP's proposed energy increase upgrades. The original 25-ton Whiting Foundry Equipment Company crane, which was installed to service the generating equipment, will be replaced with a 35-ton crane. The elevated control room (not an original feature) will also be removed as part of WWP's proposed upgrades. The original "master board" (since removed), which operated switching apparatus in the switch gear room, was also located in the generating room.[10]

Four double-leaf vertical-lift intake gates (one for each turbine unit), with three gates covering openings 4 ft x 20 ft for each intake structure, convey river storage flow to the turbines (see photograph WA-84-B-15). This design restricts water velocity through the gate openings to about 3 ft per second, even when the turbines develop optimum hp, thus maximizing efficiency of the units while minimizing stress from surge extremes.[11] A set of heavy iron trash racks in front of the intake gates extend the length of the powerhouse and protect the intake structures from debris. The present trash racks will be replaced as part of WWP's proposed upgrades. The intake gates are lifted with a mechanical operator, dubbed the "mule" by past station operators (see photograph WA-84-B-13). The mule is powered by several 2 hp motors. The mechanism moves on a track down an access bridge on the south side of the powerhouse (see photographs WA-84-B-2 and WA-84-B-3). A gear on the mule attaches to racks on the gates, which are slowly lifted by mechanical and electrical power (see photographs WA-84-B-4 and WA-84-B-14). The present vertical lift intake gates and lifting mechanisms will be replaced with new vertical lift gates and a new hydraulic gate lifting system, which will be operated by controls installed in the gantry room.

The spillway dam stands ca. 58 ft above the tailrace (low water), and measures ca. 225 ft east to west (see photograph WA-84-3). River flows exceeding the generating equipment's hydraulic capacity pass over the spillway dam. Before construction of the dam, the underlying granite river bottom was excavated, and a trench ca. 6 ft x 6 ft extending the length of the dam was dug under the upstream face of the dam, then filled with concrete, forming a water-stop. Between the downstream excavation and the upstream trench, the surface was left saw-toothed. The rough surface created a strong bond for the concrete and made the lower bond of the dam to rock impervious to water. Two expansion joints, spaced ca. 70 ft apart, were placed in the

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[10]"Hydro-Electric Power Plant of the Inland Empire System," 10 October 1908:902.

[11]"Hydro-Electric Power Plant of the Inland Empire System," 10 October 1908:901.

dam. A third expansion joint separates the dam from the powerhouse. While the upstream face of the dam is nearly vertical, the downstream side (watershed) is ogee-shaped (see photograph WA-84-B-17), producing a horizontal discharge ca. 4 ft above the bedrock. Following completion of the dam, the reservoir it created formed a pond ca. 5.0 miles long.[12]

The gravity section overfall spillway dam abuts a granite cliff on the dam's east end and the powerhouse on the west end. Removable flashboards have been installed on the dam's spillway crest. The flashboards consist of two 5-foot tiered sections which extend the length of the dam. The 10-foot additional elevation provided by the flashboards increases power generating efficiency by raising the level of the forebay, thus creating greater fall. The spillway dam will not be modified as part of WWP's present undertaking.

ALTERATIONS TO CONTRIBUTING ELEMENTS (POWERHOUSE AND DAM)

Over the years, most alterations to the Nine Mile hydroelectric plant have reflected adaptations necessary to accommodate increased power loads and to meet changing technologies for increased efficiency in the transmission of electrical power. Thus, original equipment installed principally for switching and control functions that are now monitored by modern, space-efficient PCU's in the powerhouse, or by off-site computerized control systems, have been de-energized, removed, or abandoned in-place. Such apparatus includes lightning arresters, choke coils, series coils, high- and low-tension oil switches, selector switches and other switching apparatus. Similarly, the two original switchboard panels of blue Vermont marble that once controlled the generators, transformer banks, and outgoing transmission line have been removed, as has the apparatus (excepting the turbine/generator units) that they controlled. However, in both its exterior appearance and in its arrangement of interior spaces, the Nine Mile powerhouse is little changed from early descriptions of the building.

The present control booth forms a small mezzanine above the central portion of the generator room (see upper right background, photograph WA-84-B-10). The control booth contains computerized voltage regulators, tailrace elevations monitor, and other control equipment. That system will be replaced by a new control room on the switch gear floor adjacent to the existing locker room.

A modern gravity flow lubricating system provides recirculating oil to bearings in the generator units. A metal oil storage box is situated above the exciter casings serving each generating unit (see photograph WA-84-B-11). PCU's in the generating room monitor temperature, voltage regulation, and other functions controlling the generators.

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[12]"Hydro-Electric Power Plant of the Inland Empire System," 10 October 1908:898-899.

Although virtually no mechanical changes have occurred to the original turbine/generator units, serious damage occurred to generator no. 3 on 19 December 1943 following an acute electrical surge on the system. The surge was caused by a failure of the 13 kV oil circuit breaker at the East Side Substation in Spokane during a severe winter storm. That failure separated the Nine Mile facility from other power sites within the WWP system and set into motion a series of events that caused an arc and fire in generator no. 3. The ensuing blaze was not easily extinguished:

> As the 60 kv line or generator breakers did not operate and the excitation is furnished for all units from one exciter, it was necessary in order to isolate this unit from the rest, to open certain breakers. This was accomplished by tripping the main exciter switch and the No. 3 generator oil circuit breaker. Because these units are equipped with a magnetic brake which was useless without field excitation and no mechanical brake, it was impossible to stop the rotation of this unit in the minimum of time by external means. According to a report from Mr. Dunn, who is an operator at the Nine Mile Power Station, the unit continued to rotate for approximately 15 minutes after the trouble occurred and did not stop until after the headgate had been closed. The arc was extinguished when the unit was isolated from the other three and the resultant fire was extinguished with pyrene.[13]

Generator no. 3 remained out of service for "9 days, 1 hour and 14 minutes," during which time a crew of seven men replaced 70 coils on the damaged generator.[14]

Although progressive technology has resulted in the obsolescence of ancillary equipment over the years, the Nine Mile HED's historic function is essentially unchanged. The proposed new electrical generating equipment upgrades operate on the same principle, and occupy the same location in the historic layout of the powerhouse, as the units they will replace. Similarly, replacement of new intake gates and lifting mechanisms reflect upgrades in equipment within their historic context, rather than representing a redesign or change of function of those features.

ENGINEERING AND HISTORICAL SIGNIFICANCE OF THE NINE MILE HYDROELECTRIC FACILITY

The prestigious engineering firm of Sanderson & Porter, Inc. of New York City designed the Nine Mile hydroelectric Facility. Founded in 1896, Sanderson & Porter specialized in the

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[13]"Memorandum," 31 December 1943, from "Generation: Nine Mile: Equipment: General," WWP Archives, Spokane, Washington.

[14]Ibid.

engineering, design, and construction of power plants and major industrial facilities in the United States and abroad. Between 1896 and 1966, the company placed into service more than 95 power generating units "having a total capacity of over 5 million kilowatts."[15] William F. Zimmerman, a well-known engineer with Westinghouse Electric & Manufacturing Company of New York City was retained to oversee construction of the Nine Mile facility.[16] In 1924 Zimmerman was awarded the Edward Longstreth Medal by the Franklin Institute in recognition of "meritorious improvements and developments in machines and mechanical processes."[17]

Actual construction of the Nine Mile hydroelectric facility began in July of 1906. A Spokane newspaper announced the preliminaries:

> The firm of Sanderson & Porter is known throughout the United States as being identified with large development enterprises and is engaged in the work of McCalls Ferry Power company, a large power development on the Susquehanna river near Baltimore, as well as consulting engineers on the Stanislaus power development in California.
>
> William F. Zimmermann, the well known mechanical and electrical engineer of New York city, has been employed by the Inland Empire company and will have direct oversight of the power development. Mr. Zimmermann has been connected with extensive electrical and mechanical enterprises for 20 years and has been identified with the development of some of the largest power plants in the country. For 12 years Mr. Zimmermann has been directly connected with the Westinghouse Electric & Manufacturing company.
>
> The Inland Empire company announces that it will develop 10,000 horsepower at once with facilities for increasing later on to 20,000 horsepower. The plant will cost from $750,000 to $800,000.[18]

The contract engineers capitalized on natural characteristics of the river channel in their design concept for construction of the hydroelectric facility. The site selected for the dam featured swift-flowing water between a narrow river channel which passed between high basaltic cliffs. Immediately below the dam the river is very deep, a condition which helped minimize risk of

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[15]*The National Cyclopedia of American Biography*, Vol. K, (New York: James T. White & Company, 1967:521).

[16]*Spokesman-Review*, 1 July 1906:10.

[17]*Notable Names in American History*, Third ed. (New York: James T. White & Company, 1973:600-601).

[18]*Spokesman-Review*, 1 July 1906:10.

damage to the dam from log jams or collection of debris caused by backwater.[19] The river was dammed using the power house as a part of the water-stop:

> The power house was placed in the deepest part of the river against the west bank and a water-stop wall at a proper elevation was extended up the west bank. The dam proper was placed between the power house and the east bank. The location of the dam on the east side was selected because the river was shallowest on this side. The west side was selected for the power house, for the reason that, being the deepest part of the river, the river bed made a natural tail race for the water.[20]

The powerhouse is constructed of a combination of brick, concrete, and "Cyclopean masonry," while the dam was constructed of mainly cyclopean masonry. Cyclopean masonry is a construction technique that consists of the placement of "large blocks of granite rock, well washed before going into the work, [then] placed on the concrete and wet concrete slushed around them, well tamped, no two pieces of stone being allowed to touch."[21] Cyclopean masonry was generally used when principally weight was needed to fill spaces, and to provide for foundation walls. Granite blocks used in the structures came from excavation and from a quarry adjacent to the plant. Before construction of the power plant, all "questionable" rock was removed from the riverbed, in some places to a depth of 12 to 14 ft lower than originally anticipated.[22]

In 1990, the left abutment, powerhouse, and spillway were tendoned for additional stability. This consisted of the installation of fifteen post-tensioned cable tendons.[23]

Selection of the turbine units reflected state-of-the-art technology of the early twentieth century, demonstrated the importance of scientific data in anticipating equipment needs, and indicated cost-effective planning. Based on government river gagings, studies demonstrated average flow of the river at 2,100 s.f. As concluded from an analysis of river flow data, the engineers determined that four units of 5,000 hp each (then considered nominal capacity) should be installed so that three units could be operated at any one time and the fourth unit could be kept

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[19]"Hydro-Electric Power Plant of the Inland Empire System," 10 October 1908:902.

[20]"Hydro-Electric Power Plant of the Inland Empire System," 10 October 1908:898.

[21]"Hydro-Electric Power Plant of the Inland Empire System," 10 October 1908:898.

[22]"Hydro-Electric Power Plant of the Inland Empire System," 10 October 1908:901.

[23]Joe Kurrus, correspondence with Robin Bruce, 21 May 1993.

as a spare.[24] Each unit consisted of four wheels mounted on a horizontal shaft, arranged in pairs, with a central discharge draft tube for each pair (see photograph WA-84-B-18).[25] Also known as "quad units," because there are four turbine runners on one shaft, the open-pit design of the turbines eliminated the need for, and additional expense of, penstock installation, since the quad units sit directly in the water.[26] As part of WWP's proposed upgrades to increase installed capacity from 18 to 30 megawatts, present turbine-generator units 3 and 4 will be replaced. The new generator turbines and generators will occupy approximately the same space and alignment in the powerhouse as the present units.

The concept, design, and construction of the Nine Mile HED demonstrates the ingenuity and expertise of one of the nation's most prestigious engineering firms in the completion of a hydroelectric facility that was well-suited to natural resources at that location. Based on an appraisal of conditions and resources on and near the site, including scientific analysis of river flows and characteristics, the engineers drafted a plan calculated to exploit those features both in the design of the powerhouse and dam, and in the selection of fabrications used in the building of the structures. Construction of the Nine Mile hydroelectric plant contributed to the dynamic growth of electrical railway systems in eastern Washington and northern Idaho. Although by the time WWP acquired the Nine Mile facility in 1925, revenues from those systems had decreased "to such an extent that it became imperative to . . . charge higher fares," electric railway transportation stimulated the economy of Spokane and of agricultural communities to the south and east of Spokane in the first two decades of the twentieth century.[27] Subsequently, the Nine Mile HED became an integral part of WWP's Spokane River hydroelectric networking system.

DESCRIPTION AND LAYOUT OF THE VILLAGE COMPLEX

The WWP's proposed undertaking will affect the ten caretakers' cottages that comprise the village complex, an assemblage of dwellings included within the Nine Mile Hydroelectric Power Plant Historic District. See photograph WA-84-3 for a photocopy drawing showing the location of the caretakers' cottages and their proximity to the powerhouse and dam. Although the ten

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[24]"Hydro-Electric Power Plant of the Inland Empire System, 10 October 1908:898.

[25]"Specifications Covering Water Turbines," Sanderson & Porter, Engineers, 16 November 1906:1. WWP Archives, Spokane, Washington. From file "Generation: Nine Mile: Turbines: Specifications," WWP Archives, Spokane, Washington.

[26]Joseph Kurrus, interview with Robin Bruce, 19 June 1992.

[27]Anonymous, "1925 Thirty-Sixth Annual Report of the Washington Water Power Company for the Fiscal Year Ended December 31, 1925," 1925:7, WWP Archives, Spokane, Washington.

dwellings are presently vacant, the cottages and their landscaping have retained good physical integrity. The cottages and their historic domestic setting are reminiscent of the years when company housing was considered essential to the efficient operation of the Nine Mile hydroelectric facility. Photographs WA-84-4 through WA-84-6 show contextual views of the cottages within their historic setting. The dwellings that comprise the district, including those to be affected, are described below:

Operator Cottage No. 1 (1928)

Operator Cottage No. 1 represents the most southeasterly dwelling of WWP's 1928 building phase and the residence in closest proximity to Nine Mile Dam. As such, the structure maintained a prestigious role in the village as the cottage occupied by the senior dam operator and his family. This position was reinforced by the cottage's slightly more spacious accommodations (1,122 sq ft as compared to the other cottages' average footage of 1,053 sq ft) and by its possession of the only functional fireplace. The cottage is configured as a side gable in the jerkinhead style, with exterior walls of plain red bricks laid in stretcher bond and plain wood shingle imbrication in the upper reaches of the gable ends and covering a small bay projection on the north elevation (see photographs WA-84-C-3 and WA-84-C-2). The roof covering is composed of composition shingles.

The structure's foundation is of poured concrete with a full basement containing a concrete floor. Small steel sash awning windows above all foundation elevations provide exterior illumination into the basement (see photograph WA-84-C-4). Facade embellishments include a centrally located single leaf paneled front door topped by a leaded glass fanlight. Four pairs of steel sash casement windows, each pair flanked by paneled wooden shutters decorated with diamond cut-outs in their upper panels, complete the facade fenestration (see photograph WA-84-C-1). Cottage No. 1's remaining fenestration is composed of single or pairs of multi-paned steel sash casement windows, excepting the eight-over-eight double hung wood sash window in the center of the shed-roofed bay projection. The gable ends are further detailed with louvered attic vents located beneath the jerkinhead roof line.

As originally drawn in the "Chelan Station Operators Cottage No. 3" blueprints, this design incorporated a shed-roofed back porch covering (which is designed as a projection of the roof line) supported by two wooden posts at the rear elevation (see photographs WA-84-C-8 and WA-84-C-9).[28] A half-glass door is situated under the roofed porch, which opens onto a small concrete pad. The sides of the porch overhang are also sheathed with wood shingles. In addition, the front door was accessed by way of a concrete terrace, extending from three

[28]WWP, "Chelan Station Operators Cottages No. 3, Floor Plans, Elevations & Section," blueprint drawing nos. D 3365 and D 3366, 15 August 1927, Chelan County Public Utility District No. 1, Wenatchee, Washington.

concrete steps in the northeast corner of the structure and extending to a point slightly south of the primary entrance. A low concrete foundation wall enclosed the terrace on two sides and three scuppers punctuate the terrace facade. However, this plan was altered and a porch roof was constructed over the terrace. The roof features a pediment over the cottage's front entry, with the remainder of the porch covering designed as a low angle shed roof supported by wooden posts and brick pillars.

The plastered cottage interior is divided into three bedrooms with individual closets, bath, hall with built-in coat closet and french door entry to the living room, a common living room/dining room with brick fireplace (see photographs WA-84-C-5 and WA-84-C-6), and kitchen. Located in one kitchen corner is a breakfast nook whose entrance is defined by a plaster arch (see photograph WA-84-C-7). The above mentioned bay projection contains the sink location, centered in a configuration of built-in wooden cupboards. Flooring is composed of oak in the living room and soft wood fir in all other rooms; linoleum covers the soft wood in the bath and kitchen. Access to the basement is provided by a stairway with winder treads, located immediately inside the back door and adjacent to the kitchen. A coal furnace located in the basement provided the primary heat source, but has been subsequently converted to a "gravity stoker for presto-bits."[29] The historically necessary coal chute is centrally located immediately above the foundation wall on the rear elevation.

Operator Cottage No. 2 (1928)

Located directly north of Cottage No. 1 is Cottage No. 2, another brick dwelling on a rectangular side gable plan and the only cottage in the "village" with a plain gable roof. The entire exterior wall surface of the structure is composed of stretcher bond laid brick, including the shallow gabled bay projection (cross gable) on the facade (see photograph WA-84-D-1). Additional detailing of the facade includes a grouping of three entries, each topped with inset arch details. The central entry is a single leaf multi-paned glass door which duplicates the design of the flanking pair of French door entries. A brick chimney with stepped top is also located at the facade, but functioned only as a vent for the basement-located furnace.

Not unlike Cottage No. 1, Cottage No. 2's front door was also accessed by way of a long concrete terrace or porch floor, extending from four concrete steps in the southeast corner of the structure to the shallow bay projection (see photograph WA-84-D-2). A low concrete foundation wall with brick coping encloses the terrace on two sides and three round tile scuppers provide floor drainage. This terrace has also has a porch shed roof supported by two brick and two wood square pillars built over it, a deviation from the original Chelan Station Cottages'

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[29]Spokane County Assessor, "Field Assessment Card," for WWP Cottage No. 1 at Nine Mile Dam, Office of the Assessor, Spokane County Courthouse, Spokane, Washington.

blueprints.[30] The structure contains a full concrete-walled basement, with small steel sash awning windows above the foundation sill line (see photograph WA-84-D-3). Remaining fenestration is composed of single or pairs of multi-paned steel sash casement windows. A single half-glass rear entry door is situated below a shed roof porch covering, a projection of the roof line (see photograph WA-84-D-4). This porch roof is supported by impressive scrolled brackets, configured in an oversized stickwork arrangement.

The 1,092 sq ft structure's roof covering is of composition shingles, the roof has little or no eave overhang, and a brick corbel detail is located along the length of the roof edge. Detailing of the gable ends is primarily represented by a single round vent opening in the upper portion of the gable. A small recessed Greek cross design is located in the upper portion of the cross gable projection on the front elevation and projecting brick sills are located at each window bottom. Room configuration of Cottage No. 2's plastered interior is not unlike that of Cottage No. 1, with the exceptions that the master bedroom (bedroom # 1) of Cottage No. 2 contains a plastered arch (in the front bay projection), a smaller kitchen with no bay, slightly smaller rooms, and the floor plan configuration is reversed. Floor covering treatment matches that of Cottage No. 1. See photograph WA-84-D-5 showing Cottage No. 2's living room and central entryway and photograph WA-84-D-6 showing the plastered arch in the front bay projection of that dwelling's master bedroom.

Operator Cottage No. 3 (1928)

Operator Cottage No. 3 appears to have been constructed using plans for the Chelan Station's Cottage No. 1, an 1,009 sq ft one-storied brick side gable structure (see photographs WA-84-E-8 and WA-84-E-9).[31] The dwelling is located adjacent to Cottage No. 2's north elevation. A cross gable projects on the facade from the prominent jerkinhead gable and both roofs are sheathed with composition shingles (see photograph WA-84-E-1). A covered porch roof is formed by the roof line above the front door. The primary entry is reached by way of four concrete steps and porch floor. Cobblestones, which appear to be primarily granitic stones collected locally, have been utilized in the construction of a short battered front porch foundation wall with concrete coping (see photograph WA-84-E-2). Two square brick pillars support the roof at the corners of the cobblestone wall. Decoratively scrolled rafter tails have been employed immediately above the porch on the front elevation (see photograph WA-84-E-5).

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[30]WWP, "Chelan Station Operators Cottage No. 2, Floor Plans, Elevations & Section," blueprint drawing nos. D 3361 and D 3362, 15 August 1927, Chelan County Public Utility District No. 1, Wenatchee, Washington.

[31]WWP, "Chelan Station Operators Cottage No. 1, Floor Plans, Elevations & Section," blueprint drawing nos. D 3357 and D 3358, 15 August 1927, Chelan County Public Utility District No. 1, Wenatchee, Washington.

Design alteration of the original Chelan Station plans includes construction of a truncated version of the front porch terrace.

This plan utilizes two rear cottage entries, one door on the same elevation as the front entry and an additional door on the west or rear elevation, both employing paneled, half-glass doors. The former is capped by a hip roof supported by two square wooden posts, while the latter is sheltered by a narrow gable roof supported by plain wooden brackets (see photograph WA-84-E-4). Fenestration is composed of single or pairs of steel sash casement windows, with the exception of the steel sash awning windows located immediately above the concrete foundation elevations. The exterior walls are covered with plain red brick laid in the stretcher bond manner and wood shingle imbrication in the upper region of the gable ends (see photograph WA-84-E-2). Decorative brick detailing is restricted to small corbelled projections at the building corners' eave line, projecting window sills, soldier coursing for window lintels, and a single tall rectangular inset near the top of the front elevation's cross gable.

The facade's prominent chimney does not contain a fireplace, its purpose being for smoke venting of the basement-located furnace. The interior floor plan contains three bedrooms, living room/dining room, bath, hall, and kitchen with breakfast nook and basement stairway. As in all of the village's cottages, the basement stairway contains several winder treads, however, the breakfast nook in Cottage No. 3 is located immediately off of the living room/dining room at the front of the house. A plaster arch separates the nook from the kitchen proper and a similar though larger plastered arch is located within the cross gable portion of the living room. In most regards, the interior design and selection of building materials for Cottage No. 3 is similar to that of other cottages. See photographs WA-84-E-6 and WA-84-E-7 showing views of the living room/dining room and kitchen, respectively.

Operator Cottage No. 4 (1928)

In terms of floor plan and general layout, Operator Cottage No. 4 is not unlike Cottage 2, with the exception that the floor plan has been reversed (see photographs WA-84-F-3 and WA-84-F-4). Additional changes to the exterior of Cottage No. 2 include a facade marked by a centrally located front entry door flanked by two pair of metal sash casement windows instead of French doors. The front porch and terrace details have also been changed, as well as the window configuration in the facade's cross gable. An arched fanlight over a single pair of casement windows dominates the cross gable, a curvilinear design motif which is duplicated in the five arches which support the porch roof over the front concrete terrace. These elements form an arcade with three arches located on the front elevation, one arch located adjacent to the cross gable, and one arch accessing the terrace by four concrete steps (see photographs WA-84-F-1 and WA-84-F-2). The arcade is constructed of poured concrete and finished with the application of a skim coat of stucco. A row of brick coping details the bottom chord of each arch, excepting the larger entry arch.

While Cottage No. 2 is configured as a straight gable, Cottage No. 4 is an example of the jerkinhead-style gable, the predominant roof style in the village. Cottage No. 4 also has wood shingle imbrication in its gable ends with a rectangular attic vent located below each jerkinhead. The dwelling also shares Cottage No. 2's brick corbel detail along the entire length of the roof's eave line. Red bricks used to construct this dwelling have their faces decorated with numerous vertical lines, an example of brick "combing." As Cottage No. 4 is otherwise similar to Cottage No. 2, see the above description of that cottage for further architectural description.

Operator Cottage No. 5 (1928)

Operator Cottage No. 5 appears as the embodiment of the Chelan Station Operators Cottage No. 4 (see photographs WA-84-G-3 and WA-84-G-5).[32] This design is not unlike that utilized in the brick construction of Cottages Nos. 3 and 6 of the Nine Mile complex. Similarities include the exterior brick corbelling at the building corners, floor plan and poured concrete-walled basement, with the exception of differing back entry and basement stairway configurations at the rear of the dwelling. The greatest differences between the two designs relates to each cottage's exterior finish, porch design, and application of building materials.

This dwelling is configured as a jerkinhead side gable with a half-timbered cross gable located on the front elevation. The rectangular plan has exterior walls of plain red brick and wood shingle imbrication in the upper portion of the gable ends. The half-timbered effect of the cross gable is achieved by the application of stucco over the underlying brick, an area segmented by several 1 in x 4 in wooden boards and replicating timber construction (see photograph WA-84-G-1). Cottage No. 5 has a large front porch, formed by a concrete terrace or porch floor supported by a battered cobblestone foundation wall and accessed by four concrete steps. Two square brick pillars support the porch roof, a shed extension of the gable roof with a wide hipped-return located directly above the porch stairway (see photograph WA-84-G-2). Sections of wooden balustrade are composed of sawn-wood balusters, plain handrail and bottom rail, and are located between the roof-supporting brick pillars and a half pier at the top of the steps.

Fenestration is composed of single or pairs of steel sash casement windows for walls and awning windows located immediately above the poured concrete foundation. The facade's cross gable is detailed by a bank of steel sash windows, configured as a fixed multi-paned panel flanked by opposing casement windows to either side. A prominent chimney is located on the front elevation with a design motif of stacked diamonds (referred to as a "Diaper pattern" on the

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[32]WWP, "Chelan Station Operators Cottage No. 4, Floor Plans, Elevations & Section," blueprint drawing nos. D 3369 and D 3370, 15 August 1927, Chelan County Public Utility District No. 1, Wenatchee, Washington.

elevation plan) achieved by the application contrasting colors of brick.[33] Exterior walls and the chimney body are constructed of plain red brick, while the diaper pattern is applied in dark brown brick to the face of the chimney. A shed-roofed back porch covering (which is designed as a projection of the roof line) supported by two wooden posts is located at the rear elevation and shelters the half-glassed rear entry. The roof posts set on a concrete stoop reached by a single step.

Operator Cottage No. 6 (1929)

This cottage is located on the north side of Old Charles Road and represents the cottage at the greatest distance from Nine Mile Dam. Operator Cottage No. 6 is an exact duplicate to Cottage No. 3; a one story brick dwelling configured as a jerkinhead side gable with a half-timbered cross gable and a battered cobblestone entry porch with square brick pillars on the front elevation (see photographs WA-84-H-1 and WA-84-H-2). Little or no dramatic departure in building materials, construction techniques, or plan could be determined between the two structures, even though they were part of two separate construction phases (1928 and 1929). However, bricks utilized in construction of Cottage No. 6 were decorated with a random impressed pattern, sometimes referred to as "Gothic" style brick, whereas those used in Cottage No. 3 were undecorated red brick. For a complete dwelling description see the above section detailing Operator Cottage No. 3. It is of note that an intact portion of the original wire yard fencing is located behind the Cottage No. 6 in the vicinity of the garage. This appears to be the only remaining section of 42 inch fencing which historically separated individual cottage yards in the village complex.

Operator Cottage No. 7 (1929)

Operator Cottage No. 7 is located east of Cottage No. 6 on the north side of Old Charles Road. In most regards, the cottage is a duplication of Cottage No. 4; a rectangular one story brick dwelling capped by a jerkinhead side gable with a front facing cross gable and stuccoed arcade-style front entry porch (see photographs WA-84-I-1 and WA-84-I-2). Although constructed as part of phase two of WWP's cottage construction, Cottage No. 7 appears to match Cottage No. 4 in terms of building materials, construction techniques, and general plan. Both cottages share the same floor plan alignment and surface treatment of exterior brickwork. See Cottage Nos. 2 and 4 above for a more complete architectural description.

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[33]WWP, "Chelan Operators Cottage No. 4 Elevations & Section," blueprint drawing no. D 3370, Chelan County Public Utility District No. 1, Wenatchee, Washington.

Operator Cottage No. 8 (1929)

Located on the north side of Old Charles Road and east of Cottage No. 7, Cottage No. 8 is a duplicate design to Cottage No. 5 on the south side of the lane; a one story brick cottage configured as a side gable with a half-timbered cross gable centrally located on the front elevation (see photograph WA-84-J-1). The front porch is located at the southwest building corner and is detailed with brick pillars, battered cobblestone foundation walls, and sawn-wood balusters (see photograph WA-84-J-2). Cottage No. 8 shares the same floor plan, building materials, construction techniques, and exterior detailing as its twin. See photographs WA-84-J-3 and WA-84-J-4 for an interior views of the kitchen and exterior view of the single-car detached garage, respectively. See Cottage No. 5 above for a full architectural description applicable to Cottage No. 8.

Operator Cottage No. 9 (1929)

In terms of floor plan and general layout, Operator Cottage No. 9 is similar to Cottage Nos. 3 and 6, with the exception that the floor plan of Cottage No. 9 has been reversed. Located adjacent and east of Cottage No. 8, the structure is described as a rectangular one story brick dwelling, designed as a jerkinhead side gable with a centrally located cross gable on the facade (see photograph WA-84-K-1). The front porch is located at the southeast building corner and is composed of square brick pillars, battered cobblestone foundation walls, and exposed and scrolled wooden rafter tails (see photograph WA-84-K-2). As Cottage No. 9 is otherwise similar to Cottage Nos. 3 and 6, see the above descriptions of those cottages for further architectural descriptions.

Operator Cottage No. 10 (1930)

Operator Cottage No. 10 represents the last residential cottage built by WWP at the Nine Mile locale. Located east of Cottage No. 9 and in close proximity to the Spokane River, the building plan of this dwelling appears to be a composite based on the blueprints of Cottage Nos. 8 and 9. The structure is a one story brick structure on a rectangular plan with a jerkinhead side gable. The facade is punctuated by a centrally located cross gable with a single tall rectangular inset near the top of the cross gable. The front porch entry is not unlike the plan of the porches on Cottage Nos. 5 and 8, however, the plan has been reversed and application of Cottage No. 10's porch building materials are unique to the village. Instead of the battered cobblestone short wall that supports the porch floor, a battered concrete design has been employed. In addition, the sawn-wood balustrade has been replaced by a solid low wall of bricks which intersect with the brick pillars at the porch corners (see photograph WA-84-L-1). The porch roof configuration and exposed decorative rafter tail designs are consistent with those employed at Cottage Nos. 5, 8, and 10 (see photograph WA-84-L-2).

Other similarities between these cottages include the exterior brick corbelling at the building corners, floor plan and poured concrete-walled basement, and the rear entry location at the rear elevation. Unlike the rest of the Nine Mile cottages, Cottage No. 10 was constructed of combed bricks in which buff or beige is the predominant color, rather than the red hues which dominate the other cottage exteriors. Excepting the above distinctions, Cottage No. 10 is otherwise a duplication of the Cottage No. 9 floor plan and elevations. It additionally shares the majority of building materials, construction techniques, and spirit of Cottages Nos. 8 and 9. The above architectural descriptions of those cottages should be consulted for further architectural details.

Operator Cottage Garages

Although usually considered as noncontributing and ancillary structures in a National Register nomination, car garages at Nine Mile Dam were an integral part of the overall village design. Both the blueprint drawings for the Chelan Station Operators Cottages and those from the initial Nine Mile Operators Cottages plan contain garage floor plans, section, and elevations which match those structures constructed at Nine Mile Dam.[34] These garages were erected contemporaneously with their attending residences; i.e., the first five in 1928, four more in 1929, and the final garage in 1930. Blueprint site plans for the Nine Mile facility clearly illustrate single car garages located as detached buildings to the rear of each cottage, situated so as to allow for a back yard space between the two structures (see photograph WA-84-3).

Each rectangular garage was oriented with its long axis parallel to its attending cottage (see photograph WA-84-J-4). Entrance to individual structures is by way of two ledged and braced, and opposing wooden batten doors on the front elevation (short axis). The wood-framed structures are sheathed with tongue and groove rustic wood siding and a single pair of in-swinging wood sash casement windows on one side elevation provides the only fenestration. Floors and foundations are composed of poured concrete and composition shingles cover the low angled gable roof. Exposed roof eaves project beyond the side walls twelve inches on all elevations. It appears that automobile approaches to each garage has always been by gravel or dirt driveways, although a narrow concrete sidewalk did provide pedestrian access between individual garages and their cottage's back door.

Water Tank

On the flat immediately west of the powerhouse stands a 30,000 gallon metal water tank, believed to date from the 1920s. The base of the water tower measures ca. 7 meters square.

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[34]WWP, "Nine Mile Station, Location of Operators Cottages and Garage Details," blueprint drawing no. D 3252, 20 June 1927, WWP Archives, Spokane, Washington; WWP, "Chelan Station Operators Cottages - Garages, Plan Elevations & Details," blueprint drawing no. D 3282, 15 August 1927, Chelan County Public Utility District No. 1, Wenatchee, Washington.

A wooden boxed casing encloses the center shaft. Underneath the tank, at the base of the tower, sits a brick well house with concrete cap and hinged wooden door. Deteriorating concrete footings support the four metal channels (finished with diagonal metal lacing) that comprise the tower's frame. The water tank is named as an ancillary structure in the National Register nomination (see photograph WA-84-2 for a contextual view of the water tower).[35] As part of WWP's proposed upgrades, the water tower will be removed to make way for expansion of the substation.

ALTERATIONS AND ADDITIONS (VILLAGE COMPLEX)

The Nine Mile Dam cottages have generally retained individual exterior integrity to a remarkable degree, no doubt related to their historic upkeep and single ownership by WWP. Few exterior alterations to the structures have been made since their initial construction. The most obvious changes include the installation of roof crickets at the point where the brick chimneys and cross gable roofs of most cottages meet (to facilitate water runoff and discourage the accumulation of leaves), removal of the original metal yard fencing, attachment of wooden garden trellises to cottage exteriors, enclosure of the rear porch of Cottage No. 1 (see photograph WA-84-C-4), and some modifications to individual cottage garages.

At present, eight of the garages have retained their historic location, however, several have been altered by the removal of their double entry doors or by the attachment of shed-like additions to their rear elevations. The garage of Cottage No. 1 has been removed from its foundation and relocated at some distance to the west of its original location. Cottage No. 4's garage has been demolished, although its historic location is still identifiable by its remaining concrete floor and foundation.

It appears that a redesign of the cottage's sewage disposal system was implemented ca. 1962. An existing blueprint of the new system's general layout illustrates a new septic tank and drainfield configuration.[36] These plans indicate that the prefabricated concrete septic tanks were installed during November and December of 1961. However, all cottage kitchen sinks and basement laundry trays remained attached to "old mains which empty into tandem dry wells."[37]

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[35]Garfield and Soderberg, 1990: Sec. 7:3.

[36]WWP, "Nine Mile Station Sewage Disposal System General Layout," blueprint drawing no. E-19110, 10 January 1962, Office of the County Assessor, Spokane County Courthouse, Spokane, Washington.

[37]Ibid.

Specific landscape designs around the individual cottages are unique, although the village complex does conform to a simple plan which contributed to a park-like residential setting. As designed by WWP, the plan involved two rows of five cottages facing each other across a tree-lined lane. Maple trees were planted the length of the lane, with black locust trees occasionally interspersed. Each cottage maintained a fenced yard and had room for vegetable garden plots at the rear of each lot. Narrow concrete walks provided lane access to each cottage, as well as access between cottages and their garages. Individual yard landscaping was apparently left to the discretion of resident tenants and the resulting variety of evergreen, deciduous, and lawn plantings observable today are the results of multiple cottage tenants and varying degrees of gardening interest.

PRESENT CONDITION (COTTAGES)

While all ten cottages exhibit good exterior integrity, the vacant dwellings vary in degree of interior dilapidation. Several have broken windows, with resulting interior damage due to wind, rain, and to the damaging effects of seasonal temperature variations. Consequently, most of the cottages exhibit decay caused from a lack of interior heat and from loss of human upkeep. Similarly, the remaining single-car garages behind each cottage also show the debilitating effects of neglect and weathering. However, the grounds (front, back, side yards, and remnants of original garden plots) around all ten cottages comprising the village complex retain considerable integrity, admirably reflecting the original domestic character of the setting.

ARCHITECTURAL AND HISTORICAL SIGNIFICANCE OF THE VILLAGE COMPLEX

The ten cottages that comprise the village complex are representative of the diversification and expansion of WWP's service network in the 1920s. That decade saw a marked decline in electric railway revenues and the simultaneous growth of domestic and new industrial markets. The cottages further reflect WWP's policy regarding provision of appropriate company housing at remote hydroelectric facilities throughout its service network, and is representative of "model" village complexes constructed elsewhere within the WWP system during the 1920s.

Individually, the cottages are significant for their physical integrity and for their architectural and artistic excellence. Although the cottages are representative of Craftsman and English cottage styles of the period, and though they represent variations of the same design plan, the cottages are remarkable for their diversity of exterior detailing. Collectively, the village complex provides a complementary element of domesticity to the otherwise rugged industrial site of which it is a part.

HISTORIC CONTEXT

Arrival of the Northern Pacific Railway Company (NP) through eastern Washington in 1881 facilitated vast immigration into the area. The coming of the NP particularly hastened the development of the frontier city of Spokane Falls (the name was later shortened to Spokane). Located at the spectacular Upper and Lower falls (Spokane Falls) of the Spokane River, the city was ideally suited for the development of flour milling, saw milling, and other manufacturing enterprises dependent on water power. Until the arrival of the NP, however, Spokane Falls remained a country village, the vast power of the Upper and Lower falls barely tapped. However, with the arrival of the NP in 1881, Spokane Falls quickly became the transportation center of a vast inland region which included the wheat lands of the Columbia Basin, the agriculturally rich Palouse country to the south, and the mineral and timber wealth of northeastern Washington and northern Idaho.[38] By 1910, no less than eleven railroads served the area, and Spokane's population had soared from 350 in 1880 to over 100,000 by 1910.[39]

Early Hydroelectric Development

Spokane's rapid population growth created demand for its primary asset--the motive power of its Upper and Lower Falls. Accordingly, hydroelectric development kept pace with the city's meteoric rise. In 1899 a group of local stockholders formed The Washington Water Power Company. By 1900 WWP controlled 20,000 H.P. of the 30,000 gross H.P. of the Spokane Falls.[40] That same year WWP acquired a water power site located on the south side of the river at the Lower Falls, a facility later known as "Monroe Street." By 1890, WWP emerged as the leader in hydroelectric development in Spokane, having by then purchased the interests of its principal rival, the Edison Electric Illuminating Company. WWP then began consolidating "various water power, electric and railway interests operating and owning property in the town of Spokane Falls."[41] A description of WWP and its assets in 1903 indicates the success of its consolidation efforts:

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[38]D. W. Meinig, *The Great Columbia Plain: A Historical Geography, 1805-1910* (Seattle: University of Washington Press, 1968:322).

[39]William Hudson Kensel, *The Economic History of Spokane, Washington, 1881-1910* (Pullman, Washington: Washington State University Microfilms, 1962:89-92).

[40]Northwestern Industrial Exhibition, Spokane Falls, *The City of Spokane Falls and its Tributary Resources* (Spokane Falls: Matthews Northrup & Co., Art Printing Works, 1890:40).

[41]The Washington Water Power Company (WWP), "Reclassification of Electric Plant, Statements A-I, Inclusive" (Cheney, Washington: Eastern Washington University Archives, WWP Papers, microfilm, 1937:21-22).

> For the development of its industries, Spokane offers a supply of motive power adequate to all the needs of a large manufacturing city. Here the Spokane river, breaking over a succession of basalt rocks, falls 132 feet within a quarter of a mile. This great power is owned by the Washington Water Power company, which also controls four and one half miles of the adjacent water front, suitable for manufacturing sites. The company has long operated an electric power plant [Monroe Street] . . . . It is now enlarging its electric power station, and when the improvements now under way are completed the output of the plant will be 15,000 H.P., nearly all of which is in use or contracted for. It operates the Spokane street railway system, consisting of 36 miles of electric road, and furnishes light for the city streets and to public and private buildings.[42]

That same year WWP constructed the region's first long-distance transmission line. The line originated at the newly upgraded Monroe Street Plant and terminated in the Coeur d'Alene Mining District in northern Idaho, a distance of ca. 100 miles. In 1906 WWP completed its first hydroelectric development outside Spokane at Post Falls, Idaho. The Post Falls dams (North, South, and Middle channels) and powerhouse controlled the level of Coeur d'Alene Lake (the source of the Spokane River) as a holding reservoir for its hydroelectric developments. The Post Falls facility also functioned as a transmission center, with five outgoing lines serving various consumers in Spokane, northern Idaho, and northeastern Washington.[43]

Development and Construction of the Nine Mile Hydroelectric Facility

Although clearly the leader in hydroelectric development of the Spokane River, by the early 1900s, WWP was not without rivals for the power potential of the Spokane River. At that time, emergence of electric railways captured both the public fancy and the eager attention of private financiers. Advantages of electric railway transportation included frequent, rapid transportation, and the ability to stop at any point desired. The enormous hydroelectric potential of the Spokane River made electric railway transportation especially attractive to investors.

One such investor was mining entrepreneur and capitalist J. P. Graves, who in 1904 sought funds from Eastern investors for the purpose of supporting an electric railway into the Palouse country. This vast and fertile agricultural area extended south from Spokane to the Snake River. In December of 1904 Graves announced plans to build the railway to Moscow, Idaho, a thriving community located in the eastern Palouse country. In 1905, Graves bought the power site and

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[42]*Spokesman-Review* 1 January 1903:B-1.

[43]Sanderson and Porter, Engineers, *The Hydro-Electric Power Plant of the Inland Empire System, Spokane-Washington, reprinted from* Electric Railway Journal, n.d. (Pullman, Washington: Washington State University Archives, WWP Papers, Series A: Historical and Descriptive, Group 1, Container 1, n.d.:5,7).

riparian rights at Nine Mile Bridge, located ca. 16.0 miles northwest of the Spokane business district.[44] Graves and his associates named their development corporation the Spokane & Interurban System. Fellow investors in the enterprise were Alfred Coolidge, John Twohy, F. Lewis Clark, F. A. Blackwell, H. B. Ferris, and Will Davidson. A. M. Lupfer was named supervising engineer of the corporation. In January of 1906, Graves and his associates merged their several transportation interests--the Spokane Traction Company, the Spokane & Inland Railway, the Coeur d'Alene & Spokane Electric Road, and the Spokane Terminal Company--into a single entity: the Spokane and Inland Empire Railway Company. The company commanded $20,000,000 in capital stock.[45]

Within months of the formation of the Spokane and Inland Empire Railway Company, Graves began construction of the Nine Mile hydroelectric development. As reported by a Spokane newspaper, the construction project offered both job opportunities for local laborers and construction supply potential for Spokane businesses:

> The Inland Empire Railway company has started development of its power site at Nine Mile bridge on the Spokane river about nine miles below town. Sanderson & Porter of New York city have been engaged as designing and constructing engineers and their representatives are in the city completing the plans for the undertaking of the work. It is announced by the company that they intend to employ local labor and, as far as possible, to purchase material through houses in this city.[46]

By the summer of 1907, the steel superstructure was in place and the river was flowing through the tail races beneath the building. One section of the dam had then been placed against the east banks. Dump cars conveyed concrete from the concrete batching plant situated on the terrace above (east of the powerhouse and dam) across a trestle extending across the river, where the concrete was dumped into the dam below. At that time cost of the power plant was estimated at $800,000-$1,000,000.[47]

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[44]N. W. Durham, *History of the City of Spokane and Spokane Country Washington*, Vol. 1 (Spokane, Washington: The S. J. Clarke Publishing Company, 1912:521-522).

[45]Durham, 1912:521-522,531.

[46]*Spokesman-Review* 1 July 1906:10.

[47]*Spokesman-Review*, 25 August 1907:9.

In 1911, four years after completion of the Nine Mile hydroelectric facility, an expense sheet presented to the Railroad Commission of Washington by the Spokane & Inland Empire Railway Company (excerpted below), reveals something of the magnitude of the project, not only in initial costs, but also in the number and diversity of tasks and services related to the undertaking:

Dam and Powerhouse

Clearing and Grading Power Site	$ 12,000.00
Coffer Dam and River Diversion	90,000.00
Dam and Power House Substructures	450,000.00
Power House Building	53,000.00
Head Gates and Racks	35,000.00
Bridges and Roads	25,000.00
Artesian Wells	1,000.00
Telephone Lines	3,000.00
Quarrying, Stripping and Felling	10,000.00
Temporary Buildings and Equipment	25,000.00
Temporary Power Plant	10,000.00
Teams and Feed	18,000.00
Fuel	70,000.00
Permanent Buildings	4,000.00
Transportation and Expenses	7,000.00
Insurance	3,000.00
Chemical Analyses	1,500.00
Hospital Expenses	2,000.00
Contractor's Profit, Estimated	50,000.00
Total	$869,000.00[48]

In addition to the above expenses, cost of original generating equipment totaled $270,000.00, for a grand total initial cost evaluation of $1,139,000.00. The report to the Railroad Commission also broke down distribution of power from the Nine Mile hydroelectric facility for the year ending 1910: Railroad, 80%; Commercial 20%[49]

As was the original intent of its developers, clearly, electric railroad transportation accounted for most of the power produced by the Nine Mile facility, with surplus loads sold to rural towns

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[48]"Before the Railroad Commission of Washington," 15 August 1911:1. From file "Nine Mile: General: Costs," WWP Archives, Spokane, Washington.

[49]"Before the Railroad Commission of Washington."

in the transportation network. This power distribution reflected J. P. Graves' (president of the Spokane and Inland Empire Railroad Company) purpose of powering a vast regional electric railway system. Although a short-lived phenomena, prospering roughly from 1897-1917, electric railway transportation (also known as "traction" systems) stimulated development of power generating facilities in Washington. New markets created by electrical service to small towns, and fostered by the introduction of a host of domestic electrical appliances developed by WWP and other power producers, replaced loads formerly used by the diminishing traction markets. As the history of the Nine Mile hydroelectric facility demonstrates, early developments of power generating facilities built expressly to power electric railway transportation later provided an infrastructure which facilitated the expansion of previously established electrical supply systems.[50]

Acquisition of the Nine Mile Hydroelectric Facility by WWP

By 1915, the Nine Mile hydroelectric facility was the only power generating development on the Spokane River not owned by WWP. By then, owing to new electrical markets and because of the advent of automobile and improved rural transportation systems, the popularity of electric railways had sharply declined. Over the next few years, as WWP's own electrical markets expanded and changed, the company saw the necessity of integrating the Nine Mile facility with their own hydroelectric generating systems. Not only did the Nine Mile plant directly compete with WWP for power supply contracts in territory served by WWP, but it also restricted WWP's regulation and release of water from Coeur d'Alene Lake. In 1922, the Nine Mile facility was offered for sale by the Spokane and Inland Empire Railway and Power Company, then in receivership. Shortly afterward, however, the company was reorganized under the ownership of the Spokane and Eastern Railway and Power Company. WWP began negotiating for the Nine Mile facility in 1924. On 1 July 1925, WWP and the Spokane and Eastern reached an agreement of sale.[51]

In addition to purchase of the Spokane and Eastern's electric railway loads, WWP acquired a number of large existing loads and contracts, including Greenacres Light and Power Company, Inland Empire Paper Company, and the Northern Pacific Railway Company. Purchase of the Nine Mile hydroelectric facility also included two transmission lines to Spokane, the Erie Street Substation, and a short transmission line extending from the Nine Mile plant up the Little Spokane River. With an installed capacity of 12,000 kilowatts, acquisition of the Nine Mile hydroelectric facility increased the total installed capacity of WWP power generating plants to 139,750 kilowatts.[52]

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[50]Lisa Soderberg, "Hydroelectric Power Plants in Washington State, 1889-1938," NRHP nomination, July 1988. Office of Archaeology and Historic Preservation (OAHP), Olympia.

[51]"Reclassification of Electric Plant."

[52]"Reclassification of Electric Plant."

Construction of new housing at Nine Mile was part of a $4,500,000 building and renewal plan for the WWP system in 1927. Although initiation of construction was postponed until 1928, the Nine Mile cottages were one of several planned improvements for that facility, including installation of a new pumping system for domestic water and "within the station, ventilation will be improved in the generating room and a new type of lightning arresters will replace those now in use."[53]

WWP Development of the Village Complex

By 1927, WWP had begun development of a design plan for new housing construction for dam workers and their families, located adjacent to the Nine Mile Dam complex. These residential units would replace existing wooden houses, described in 1934 as, "the obsolete frame structures formerly occupied by the station operators."[54] It appears that two dwellings, apparently contemporaneous with dam construction, were located north and northeast of the area now containing Operator Cottages Nos. 6-10 (see photograph WA- -B-1).

Review of Nine Mile cottage blueprints of 1927 indicates that at the time of initial WWP cottage construction, numerous structures associated with the Spokane & Inland Empire Railway & Power Company-era ownership of the Nine Mile facility were extant on-site. Besides the powerhouse, these structures included the two dwelling houses mentioned above and a cookhouse with detached woodshed in the vicinity of the present location of garages for Operator Cottages Nos. 1-5. In addition, several structures, including a machine shop, storehouse, elevated wooden water tank, ice house, and secondary storehouse were located west of the powerhouse and along the bank of the Spokane River.[55] All of these structures have been removed or replaced with new construction.

WWP's planned village would eventually be comprised of ten brick residences, variously constructed as examples of Craftsman or English Cottage-style architecture.[56] The new development began in 1928 with construction of five one-story houses with accompanying wood frame, detached garages in an area southwest of the dam and directly south of the historic bridge

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[53]"$4,500,000 Is Sum in W.W.P. Budget," *Spokesman-Review*, 27 March 1927:1.

[54]Washington Water Power Company (WWP), "Nine Mile Power Station," "Generation: Nine Mile: Structures: Operator's Village" file, 1 March 1934, WWP Archives, Spokane, Washington.

[55]WWP, "Nine Mile Station, Location of Operators Cottages and Garage Details."

[56]Garfield and Soderberg, "Nine Mile Hydroelectric Power Plant Historic District," 1 August 1990: Section 7:2.

crossing which provided access to the dam compound (see photograph WA-84-3). Located side-by-side and constructed in a fan configuration, these first five cottages straddled the south side of Charles Road, presently named Old Charles Road. As reported in a Spokane newspaper:

> The Nine Mile cottages are the second series of brick houses to be built by the Washington Water Power company for power station employees. The first brick operator's cottages were erected last year at the new Chelan plant. At the Long lake, Little falls and other [WWP] stations frame cottages are provided. In each case the grounds and the buildings have been improved and the surroundings made attractive.
>
> According to M.W. Birkett, general manager, the power company has always taken the view that the best home accommodations were none to good for the men and women who make their homes near the various power stations.[57]

Indeed, WWP has historically maintained a commitment to the provision of employee residences at its various out-of-town power plants. Besides Little Falls, Long Lake, and Chelan (completed in 1910, 1916, and 1927, respectively), WWP had previously built housing at the Post Falls plant (completed 1906), located on the Spokane River near the Washington and Idaho state line. During construction of WWP's Long Lake Dam, members of the Spokane Transportation Club undertook an "auto tour" which included inspection of the "model houses for employees of the company" at that facility.[58] Evidence of WWP policy concerning employees living at remote power stations is provided in the Company's 1913 response to an inquiry from the Pacific Power & Light Company (PP&L). It appears that PP&L was soliciting input prior to formulation of its own policy "in regard to furnishing light, fuel, water, and a suitable dwelling for employe[e]s at water power stations located at a distance from town."[59] A portion of the WWP General Manager's response is quoted as follows:

> I would advise you that we have two such situations at present. One our Post Falls power plant, which is located quite close to the town of Post Falls, Idaho, where the Company built modern houses for the employees, for which they pay a nominal rent of $10. per month. The electricity for lighting is furnished without cost as well as water for domestic purposes and lawn sprinkling, etc.

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[57]"New Homes of W.W.P Employees at Nine Mile," *Spokesman-Review*, 2 September 1928:Section 2:5.

[58]"Long Lake Dam Is Visited," *Spokesman-Review*, 24 May 1914:Section 1:6.

[59]J.H. Siegfried, Pacific Power & Light Co. Superintendent of Power, correspondence to Washington Water Power Company management, 17 December 1913, WWP Company Papers, Series 4, Group 7:2, Eastern Washington University Library Special Collections, Cheney, Washington.

> The Company does not furnish electricity or any fuel for heating purposes. At our Little Falls Plant, which is located about 35 miles from Spokane, and practically out in the woods, the Company furnishes modern six-room houses without charge to the employees, and also furnishes electricity for lighting and spring water under pressure for domestic and irrigation purposes.
>
> In our Spokane water power plant [located within the city limits] no houses are furnished to the employees.[60]

Brick housing completed at the Nine Mile (n=10) and Chelan (n=7) plants marked a departure from the previous WWP wood frame construction practice, a policy which may have reflected a change in WWP's cultivation of its public image, the perceived need for a more permanent family-oriented compound, or overall construction costs. During the planning stage prior to cottage construction, "the cottage plans used at Long Lake, Little Falls, Post Falls, Oroville, etc" were considered for Nine Mile.[61] It was determined, however, that the expense of redrawing any of these plans would equal that of preparing new house blueprints. WWP had in mind housing which could be constructed for about $4,000 per cottage. It appears that WWP initially planned to construct wood frame 1-1/2 story dwellings at Nine Mile, a plan which was subsequently changed to 1-1/2 story brick homes.[62]

None of the proposed 1-1/2 story dwelling were ever constructed on-site by WWP, although some ideas from the original cottage development were incorporated into the completed cottage configuration. WWP had planned to build five cottages as a first phase of residential construction, utilizing a total of three unique blueprints. As stated in Specification #53, "plans

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[60]WWP General Manager, correspondence to J.H. Siegfried, Pacific Power & Light Company, Superintendent of Power, 22 December 1913, WWP Company Papers, Series 4, Group 7:2, Eastern Washington University Library Special Collections, Cheney, Washington.

[61]George H. Keith, WWP employee, memorandum concerning the Nine Mile Cottages to Mr. Greisser, 2 April 1927(?), WWP Archives, Spokane, Washington.

[62]B.M. Merril, WWP employee, memorandum to Mr. Greisser concerning cottages at the Nine Mile Station, 9 April 1927; "Nine Mile Station Operators Cottage Nos. 1, 2, and 3" blueprint drawings, 20 June 1927; "Nine Mile Station Operators Cottage Nos. 1, 2, and 3 Supplementary Drawings Revising Construction" blueprint drawings, WWP Archives, Spokane, Washington.

show details of cottage Nos. 1, 2, 3. Nos. 2 and 3 with arrangement reversed."[63] In essence, WWP determined to realize design diversity at Nine Mile by flip-flopping the plans of three distinct construction designs. Review of cottage blueprints drawn for the Chelan plant and comparison with the existing Nine Mile village indicates that many of these plans were utilized for the cottages at Nine Mile, although with some alterations. "Chelan Station Operators Cottages Nos. 1-5," or variations thereof, appear to be those used in the construction of Operator Cottages Nos. 1-10 at Nine Mile.[64] Correlation between Chelan Station blueprints and existing Nine Mile cottages is summarized below in Table 1.

Table 1: Relation of Nine Mile Cottages and Chelan Station Cottage Blueprints

Nine Mile Cottage Nos.	Chelan Station Cottage Blueprint Nos.	Nine Mile Cottage Floor Plans	Nine Mile Cottage Major Exterior Alterations
1	3	as drawn	covered front porch added
2	2	as drawn	covered front porch added
3	1	as drawn	covered front porch added
4	5	as drawn	as drawn
5	4	as drawn	as drawn
6	1	as drawn	covered front porch added
7	5	as drawn	as drawn
8	4	as drawn	as drawn
9	1	reversed	covered front porch added
10	4,5	reversed	covered front porch added

It is of note that in its "Instructions to Bidders" for the Nine Mile cottages, under Article 6, WWP reserved the right to reject construction bids from "all tenders, and the lowest bid will not necessarily be accepted," evidence yet again of WWP's commitment to their investment,

[63]WWP, "Specifications: Operators' Cottages and Garages for the Washington Water Company at Nine Mile Station, Spokane County, Washington," 28 July 1927, WWP Archives, Spokane, Washington.

[64]WWP, "Chelan Station Operators Cottages Nos. 1-5," 15 August 1927, Chelan County Public Utility District No. 1, Wenatchee, Washington.

employee relations, and public image.[65] Construction of the first units at Nine Mile Dam was publicly announced on 2 September 1928, with accompanying photographs:

> These are the five new brick bungalows recently completed by the Washington Water company for its operating employees at the Nine Mile power station. The new homes have been occupied, but the grounds have yet to be graded, seeded to grass and landscaped, which has been ordered done by the company at its expense.
>
> Each house contains five rooms and a bathroom. There are three bedrooms, a kitchen and large living room, which can be used when required as a dining room. The buildings are provided with furnace heat and wired for electric ranges and other electric conveniences. There is a full basement and substantial construction throughout, with permanency as well as beauty and utility in mind. Water under pressure is provided.[66]

Based on the associations between the first cottage tenants, newspaper photographs published in the aforementioned newspaper article, and recent observations of cottages at Nine Mile, the following Table 2 has been generated to summarize initial cottage occupation by Nine Mile Dam operators.

Table 2: 1928 WWP Employee Tenants of New Cottages at Nine Mile Dam

Nine Mile Cottage No.	First Tenant
1	Louis Engelhart
2	E.J. Ostelburn
3	Joe Mulherin
4	G.W. Fallis
5	H.W. Pederson

Upon completion and occupation of the first five cottages, WWP commenced installation of wire fences around these dwellings and their yards in September 1928. As summarized in 1934,

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[65]WWP, "Instruction to Bidders," n.d., but probably ca. 1927, WWP Archives, Spokane, Washington.

[66]*Spokesman-Review,* 2 September 1928:Section 2:5.

"approximately 1400 lineal feet of 42" American Lawn Fence, Style A-1, was erected around and between the five cottages on the south side of the roadway," an installation that excluded each cottage's rear garden space and garage.[67] With the completion of the tenth and final brick structure in 1930, the five cottages located on the north side of Charles Road were likewise enclosed with metal fencing, including an additional fence of 660 ft to enclose a common garden to the rear of these dwellings. Each cottage was then supplied with a private fenced yard, accessed by 42 inch walk gates at the front and rear fence of each property.

A WWP memorandum summary of the construction of the final cottage, dated 1 March 1934, is perhaps instructive in the general construction effort involved in developing the operators' village. Construction work on Operator Cottage No. 10 commenced 21 July 1930 and was completed on 8 November 1930. The building summary of work performed included removal of ca. 225 cubic yards of gravel and boulders from basement excavation by horse "team, scraper, and hand labor" and ca. 12,000 "varsity face brick and 800 5" x 12" building tile were used in the construction of the [cottage's] 9" walls and chimneys."[68] WWP's 1930 expenditure for construction of Cottage No. 10 included $2,315.06 (labor) and $4,195.39 (materials), for a total construction cost of $6,510.45.[69] Additionally, WWP built individual unattached wood-framed garages at the time of each cottage's construction. These were one-car rectangular structures measuring 12 ft wide x 18 ft long with concrete foundations and floors. As summarized in 1934, labor ($181.09) and materials ($161.99) for construction of each garage totaled $243.08.[70]

As identified by Garfield and Soderberg, extant structures identified as part of the Nine Mile Hydroelectric Power Plant Historic District are a "well preserved example of a power plant specifically developed in conjunction with a transportation network."[71] While this statement is certainly true for the powerhouse, dam, and earliest wood-framed structures historically associated with the complex, construction of ten brick cottages at Nine Mile Dam by WWP in 1928-30 is more reflective of the changing nature of hydroelectric power as the consumption of

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[67]WWP, "Nine Mile Power Station, Subject: Construction Costs and List of Material for Wire Fences Surrounding Operators Cottages and Grounds at Nine Mile Power Station," 24 January 1934, WWP Archives, Spokane, Washington.

[68]WWP, "Nine Mile Power Station," "Generation: Nine Mile: Structures: Operator's Village" file, 1 March 1934, WWP Archives, Spokane, Washington.

[69]Ibid.

[70]J.S. McNair, "Nine Mile Station: Construction of Garages for Operators' Cottages at Nine Mile Power Station," 27 February 1934, WWP Archives, Spokane, Washington.

[71]Garfield and Soderberg, 1 August 1990.

electricity for domestic and industrial use was increasing, even as electric interurban and street railway demand was in decline. With its acquisition of the Nine Mile power site, WWP became the sole owner of the United Railways Company (SUR), a company that they previously co-owned with the Spokane City Railways Company. Unfortunately, from the time of its initial incorporation, SUR had always operated at a loss.[72]

Not even an increase of streetcar fares in 1925 could reverse SUR's business fortune and by 1931, traffic had declined thirty-three percent from its 1922-operating inception, events which necessitated replacement of trolley cars with motor buses.[73] During the same period, alternate hydroelectric demand grew dramatically. The traction and/or other street railway transportation industry had surely stimulated development of Nine Mile and other early power sites, but "as the traction load diminished in Washington, domestic, commercial and industrial light and power loads increased."[74] Testimony to these changing events is provided by the *Spokesman-Review's* "Know Your Own Community No. 13" series of 1927, in which the benefits to Spokane of "another great natural resource--water power" is extolled:

> The electric power is continuous and uninterrupted, and is used to operate the mines of the famous Coeur d'Alene, Idaho, district, run the trains of the Chicago, Milwaukee & St. Paul railroad, maintain extensive irrigation projects and supplement the supply of power at Seattle and Tacoma, to drive street cars, light homes and turn the wheels of industry.
>
> The Inland Empire is one of the foremost sections of the United States in the use of electricity in its homes.[75]

In the above mentioned newspaper article, WWP is duly credited for its role in this development, including operation of the Nine Mile Dam, as well as other Spokane River plants, and those in Oroville and Chelan (then under construction). WWP summarized its operating history, to date, in 1930 and noted its "tremendous development in the electric power available

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[72]Charles V. Mutschler, et al., *Spokane's Street Railways: An Illustrated History*, Spokane: Inland Empire Railway Historical Society (1987:70).

[73]Ibid.

[74]Soderberg, "Hydroelectric Power Plants in Washington State, 1890-1939," July 1990:Section E:7.

[75]*Spokesman-Review*, 15 September 1927:20.

to home, farm, factory and railroad."[76] Instrumental to additional growth of the power industry was the role of new electrically-powered inventions. As note by WWP, "the first use of electricity was for street lighting by means of arc lamps, and its first use in the home was for illumination purposes."[77] Between 1881 and 1907 "lamp" or light bulb efficiency increased 367.20%.[78] Additionally, home electric use increased with the widespread adoption of appliances dependant upon electric motors or elements. "Chief among these many appliances are the following:

> Electric range; electric refrigerator; electric washing machine; electric ironer; radio; electric water heating; electric table appliances; electric vacuum cleaner; and electric fans."[79]

A similar electrical power revolution was occurring on the farm and in rural communities as an increasing variety of electrically-powered innovations replaced the dependence on human power there as well. Utility companies, including WWP, actively sponsored education programs to highlight the labor-saving nature of electrical appliances, while at the same time procuring patents on new inventions and aggressively selling appliances to an eager consumer market. Through its widespread electrical power transmission system, WWP simultaneously stimulated increasing dependence on hydroelectric power by way of appliance sales and supplied the power to those same electrically-dependent improvements within its service area.

Increased residential development within Spokane County and automation at the Nine Mile plant led to a gradual decline in cottage residency, with Cottage No. 1 recently vacated. The beginning of the village's residential disuse occurred in the early 1980s.[80] However, the operator village concept, as represented at Nine Mile Dam, is significant as the residential component that accompanied power plant utilization in remote locales during the early twentieth century, a period marked by an evolution from the declining hydroelectric power use of interurban and street railway transportation systems to the increasingly demanding electrical power markets of home and industry.

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[76]WWP, *The Story of The Washington Water Power Company: 1889-1930*, Spokane: The Washington Water Power Company (1930:22).

[77]WWP, 1930:28.

[78]Ibid.

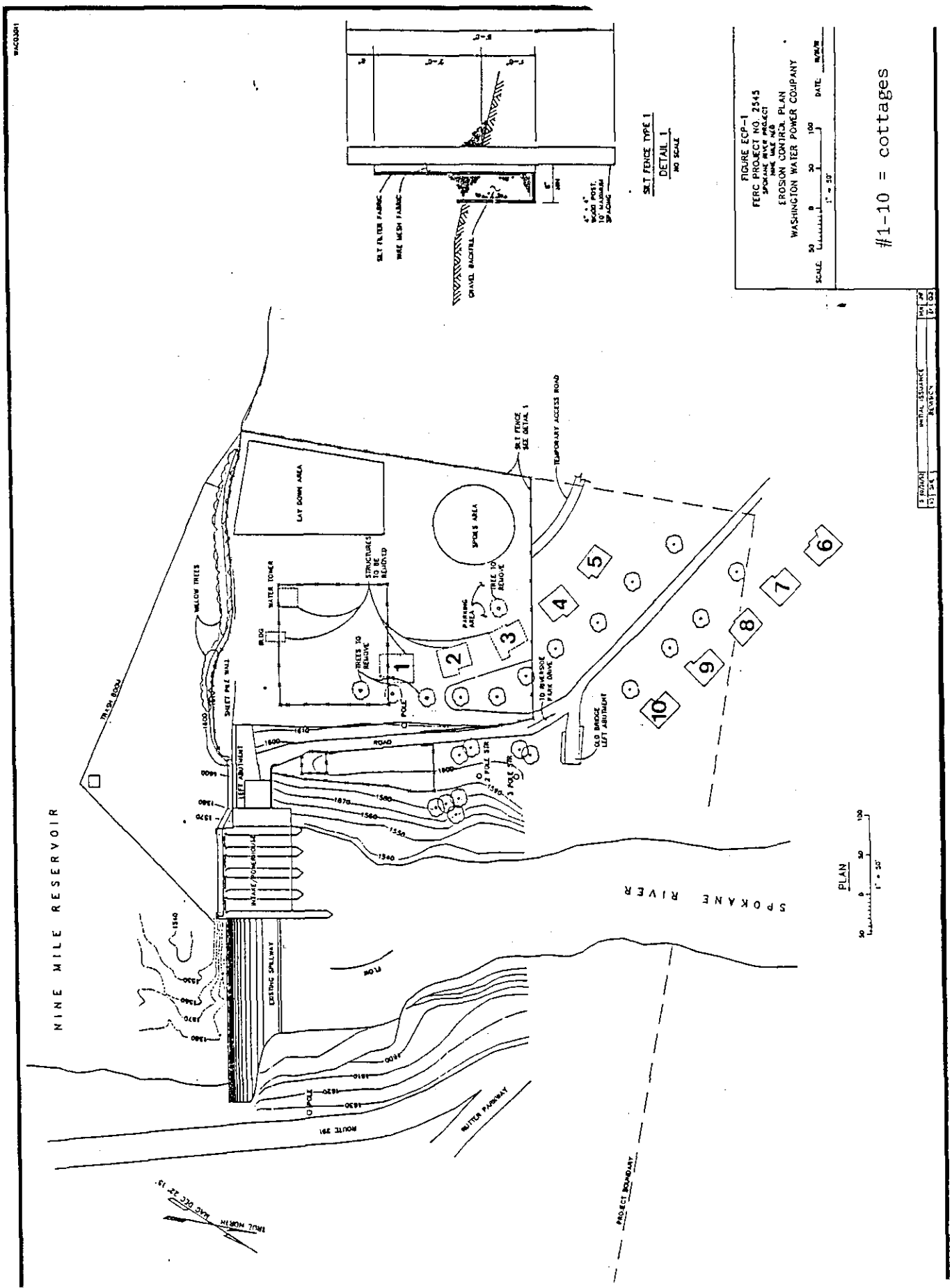
[79]Ibid.

[80]*Spokesman-Review*, 11 February 1993:D12.

SUMMARY

The structures that presently comprise the Nine Mile Hydroelectric Plant Historic District reflect two phases in hydroelectric development at that site. Initial construction of the powerhouse and dam represented the efforts of local capitalists in exploiting hydroelectricity in developing and providing motive power for the operation of extensive electric railway systems. Following the decline in the popularity of those transportation systems, purchase of the Nine Mile facility by the WWP reflected WWP's consolidation of its Spokane River hydroelectric systems and expansion and diversification of the company's service network. Construction of the ten caretakers' cottages (1928-1930) reflect that period of expansion and the labor-intensive technology that required provision of company housing to assure adequate manpower in monitoring and mechanically operating control mechanisms at the Nine Mile facility.

The WWP's proposed upgrades to increase energy production at the Nine Mile HED represent modifications in keeping with incremental technological advances during the twentieth century. Such advances in hydroelectric generating, transmission, and control apparatus has allowed for recurrent expansion in power production resulting from increased demands on the load-carrying capacity of a vital hydroelectric system. Conversely, those same advances and influences, particularly the increased sophistication of computerized control systems, have eliminated the need for the numerous operators who once monitored and mechanically operated control mechanisms around-the-clock at the Nine Mile HED. In turn, reduced manpower requirements has made the need for company housing largely obsolete. Physical and technological changes that have occurred at the Nine Mile HED over the years are representative of the dynamic and changing nature of large industrial complexes designed to supply motive power for business, industry, agriculture, and domestic consumption in a broad geographic region.



Nine Mile Hydroelectric Development Sketch Plan.

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